COURSE DESCRIPTION CARD - SYLLABUS

Course name
Thin films [S1IMat1>CW]

Course

Field of study
Materials Engineering

Year/Semester
3/6

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
15

Laboratory classes
0

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

Knowledge: Basic knowledge of chemistry, physics and materials science. Skills: Logical thinking, use of the information obtained from library and Internet. Social competencies: Understanding the need for learning and acquiring new knowledge

Course objective

The knowledge of thin film concepts and their depositions, properties and applications.

Course-related learning outcomes

Knowledge:
the student has knowledge about the needs of thin film applications in modern industry.k_w08 k_w10
the student has knowledge about thin film depositions. k_w01 k_w08

Skills:
the student can propose the applications of thin films in modern industry. k_u01, k_u02, k_u12
the student can choose the proper thin films depositions for specific requirements. k_u01, k_u02, k_u12

Social competences:
the student can collaborate in order to obtain and implement the new knowledge. k_k03
the student is aware of importance of nanotechnology in modern science, industry and society. k_k02

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Lectures:
Written test at the end of the semester
Projects:
The final report prepared according to lecturer’s guidelines.

Programme content

1.Basic concepts of thin films
2.Applications of thin films in industry
3.Epitaxial thin films
4.Thin film growth modes
5.Typical substrates for thin film depositions
6.Physical methods of thin film depositions (evaporations, PLD, sputtering).
7.Chemical methods of thin film depositions (MOCVD, sol-gel, hydrothermal method).

Teaching methods

1. Lecture: multimedia presentation.
2. Laboratory exercises: performing exercises, discussion, team work.

Bibliography

Basic
1. Nanomateriały inżynierskie, K. Kurzydłowski, M. Lewandowska (red.), PWN 2010
2. Wstęp do fizyki ciała stałego, Kittel C., PWN, Warszawa, 1999
3. Nanoelectronics and Information Technology, Waser R., Wiley-VCH, Berlin, 2003
4. Nanotechnologie, R.W. Kelsall, I.W. Hamley, M. Goeghegan (red.), PWN, 2008
Additional
1. Oleś, Metody doświadczalne fizyki ciała stałego, WNT 1998
2. Handbook of thin film devices, M. H. Francombe (red.), Acad. Press, San Diego, 2000
3. scientific papers

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	15	1,00